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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,252	01/30/2004	David Keller	200207762	8154

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EXAMINER,

FIDLER, SHELBY LEE

ART UNIT PAPER NUMBER

2861

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/769,252	Applicant(s) KELLER ET AL.	
	Examiner Shelby Fidler	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10, 12-18, 21, 23-28 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6, 7, 17, 18, 27 and 28 is/are allowed.
- 6) ☒ Claim(s) 1, 4, 10, 12, 15, 21, 23, 25 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see page 13 of the remarks, filed 1/8/2007, with respect to the rejection(s) of claim(s) 1 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn and the finality of the Office Action dated 11/7/2006 is withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Tachihara et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 12, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lesniak (US 5387976) in view of Tachihara et al. (US 6447088 B2).

Regarding claims 1 and 12:

Lesniak discloses a fluid ejection device comprising:

a die (ink-jet printhead 40) including a plurality of nozzles (nozzles 42) variously configured according to a predetermined distribution (the distribution shown in Fig. 5), the plurality of nozzles having a target mean drop volume (desired drop-volume) and an actual mean drop volume (inherent drop-volume); and

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a controller (ink-jet printhead controller 62) configured to set the actual mean drop volume provided by the plurality of nozzles to the target mean drop volume (col. 7, lines 62-67) by selectively firing selected nozzles (col. 8, lines 2-6 show that each drop is modified during printing; col. 4, lines 41-44 show that nozzles are selectively driven during printing; thus the nozzles that are selectively driven during printing are all modified).

Lesniak does not expressly disclose that the controller is configured to set the actual mean drop volume of the die to the target mean drop volume by selectively firing some nozzles of a subset of commonly sized nozzles.

However, Tachihara et al. disclose selectively firing some nozzles of a subset of commonly sized nozzles (discharging ports t or t') to achieve a target mean drop volume (any one of 0, 5, 11, or 16 $E^{-15} m^3$; col. 4, lines 16-25).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the selective nozzle subset firing of Tachihara et al. into the invention of Lesniak. The motivation for doing so, as taught by Tachihara et al., is to achieve gradation recording of a high quality picture (col. 2, lines 58-61).

Regarding claim 23:

Lesniak discloses a fluid ejection device comprising:

a die (ink-jet printhead 40) including a plurality of nozzles (nozzles 42) variously configured according to a predetermined intended distribution (the distribution shown in Fig. 5), the plurality of nozzles having a target mean drop volume (desired drop-volume) and an actual mean drop volume (inherent drop-volume); and

a control system (ink-jet printhead controller 62) configured to set the actual mean drop volume of the die to the target mean drop volume (col. 7, lines 62-67) by selectively firing

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selected nozzles of the die (col. 8, lines 2-6 show that each drop is modified during printing; col. 4, lines 41-44 show that nozzles are selectively driven during printing; thus the nozzles that are selectively driven during printing are all modified).

Lesniak does not expressly disclose that the nozzles are configured with various sizes, wherein the size of each nozzle is selected according to a predetermined distribution that defines at least a boundary interval of nozzle sizes and a probability distribution of nozzle sizes; and that the control system is configured to set the actual mean drop volume of the die to the target mean drop volume by selectively firing nozzles in a subinterval of nozzle sizes.

However, Tachihara et al. disclose nozzles (discharge ports) configured with various sizes (Fig. 8), wherein the size of each nozzle is selected according to a predetermined distribution (the distribution shown in Fig. 8) that defines at least a boundary interval of nozzle sizes (col. 7, lines 11-13 show that the nozzles are between 13 and 28 microns in size) and a probability distribution of nozzle sizes (the distribution shown in Fig. 8); and

selectively firing nozzles in a subinterval of nozzle sizes (discharging ports t or t') to achieve a target mean drop volume (any one of 0, 5, 11, or $16 \text{ E}^{-15} \text{ m}^3$; col. 4, lines 16-25).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize nozzles configured with various sizes into the invention of Lesniak. The motivation for doing so, as taught by Tachihara et al., is be able to discharge ink droplets having different sizes, and to achieve gradation recording of a high picture quality (col. 2, lines 58-61).

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Claims 4, 15, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lesniak as modified by Tachihara et al., as applied to claims 1, 12, and 23 above, and further in view of Raman et al. (US 6655755 B1).

Regarding claims 4, 15, and 25:

Lesniak as modified by Tachihara et al. disclose all claimed limitations except that the nozzles are configured according to a normal distribution of nozzles sizes.

However, Raman et al. disclose that it is common for inkjet printheads to have nozzles configured according to a normal distribution of nozzle sizes (col. 2, lines 55-58 and Fig. 1).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to provide nozzles that are configured according to a normal distribution of nozzle sizes into the invention of Lesniak as modified by Tachihara et al. The motivation for doing so, as taught by Raman et al., is to produce the printhead in high volume (col. 2, lines 52-58).

Claims 10, 21, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lesniak as modified by Tachihara et al., as applied to claims 1, 12, and 23 above, and further in view of Yuan et al. (US 5609919).

Regarding claims 10, 21, and 30:

Lesniak as modified by Tachihara et al. disclose all claimed limitations except that the plurality of nozzles is arranged on the die so that large nozzles are pseudorandomly intermixed with small nozzles.

However, Yuan et al. disclose a plurality of nozzles (nozzle openings 16e and 16g) arranged on a die (disc 15e) so that large nozzles are pseudorandomly intermixed with small nozzles (Fig. 2f).

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At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize large nozzles that are pseudorandomly intermixed with small nozzles into the die of Lesniak as modified by Tachihara et al. The motivation for doing so, as taught by Yuan et al., is to allow variably sized droplets to be produced with a tailored size and flux distribution (col. 6, lines 49-52).

Allowable Subject Matter

Claims 6, 7, 17, 18, 27, 28 are allowed.

See prosecution history for reasons for allowance.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Communication with the USPTO


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shelby Z. Fidler 1/21/2007

Shelby Fidler
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STEPHEN MEIER
SUPERVISORY PATENT EXAMINER